

REMARKS

Reexamination and reconsideration of the claims 123-143 and 161-167 are respectfully requested. The allowance of claims 144-160 and the Examiner's indication of allowable subject matter in claims 129, 131-137, 139-143, 167, and 168 are acknowledged with appreciation. Claim 168 is cancelled without prejudice.

Applicants also appreciate the consideration of the previously filed Information Disclosure Statement (IDS). Additionally, Applicants respectfully request that the Examiner consider the documents listed on the IDS dated January 18, 2002 by initialing and signing the submitted form and returning a copy of the same to the Applicants. Furthermore, a petition for an extension of time under 37 C.F.R. 1.136(a) is included herewith.

Claims 123-143, 166, and 167 were rejected under 35 U.S.C. sec. 112, second paragraph, for being indefinite. Claims 123-168 were amended, thereby clarifying that a fiber optic cable installation structure is being claimed. Thus, with respect to claim 123, the recitation of a filling material, partially filling the channel, that was "not previously evacuated to form the channel" is clear. In other words, the filling material includes material that was not removed when forming the channel. Moreover, since a fiber optic cable installation structure is claimed it is not necessary to recite a method or manner for forming the channel. With respect to claim 166, the claim was amended to remove any indefiniteness that may have existed. Additionally, the amendment of claims 123-168 is not an admission that the art of record teaches, discloses, or otherwise suggests the features of the claims. Withdrawal of the sec. 112 rejection, second paragraph, of claims 123-143, 166, and 167 is respectfully requested.

Claims 161, 165, and 166 were rejected under 35 U.S.C. sec. 102(b) applying U.S. Pat. No. 4,896,997 ('997). Claim 161 was

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amended to include the subject matter of claim 168, which was indicated as allowable by the Examiner. For at least this reason, withdrawal of the sec. 102(b) rejection of claims 161, 165, and 166 is warranted and is respectfully requested.

Claims 123-127, 138, 162, and 163 were rejected under 35 U.S.C. sec. 103(a) applying U.S. Pat. No. 4,896,997 ('997) in view of U.S. Pat. No. 4,812,078 ('078). The '997 patent requires trenching a relatively wide path in order to bury a cable and sheath assembly deep within the ground using a tractor. See Fig. 1 and the Abstract of the '997 patent. Likewise, the '078 patent requires digging a relatively wide trench and laying an elongate object deep within in the ground, and then covering the elongate object with a fine powdery material before backfilling the trench. See Fig. 1 and the Abstract of the '078 patent. For a patent to be applicable under sec. 103(a), the teaching must, *inter alia*, expressly or inherently, teach, disclose, or suggest each and every feature of the claimed invention. Additionally, motivation and suggestion to combine the patents must be present.

The sec. 103(a) rejection of claims 123-127, 138, 162, and 163 is respectfully traversed for the following reasons. Claim 123 recites a fiber optic cable installation structure including a surface defining a channel having a width of no more than 12 mm, a cable disposed within the channel, the cable including a tube sized to fit within the channel and at least one optical waveguide disposed within the tube, and a filling material overlying the cable and at least partially filling the channel, the filling material at least partially comprised of material not previously evacuated to form the channel.

It is respectfully submitted that the applied art, taken alone or in combination with the other art of record, does not implicitly or expressly teach, disclose, or suggest all of the features of claim 123. The Office Action states that the recitation of the width of the channel has not been given

patentable weight because Applicants do not disclose critically or properly establish unexpected results for the claimed range. See p. 6 of the Office Action dated October 3, 2002. First, this statement is not accurate. The present invention is advantageous because the road formation is barely broken up. See the present application at p. 6. Additionally, the following is discussed at p. 16 of the present application:

The cable is supported by the very narrow laying channel, with the result that the risk of buckling is reduced. Moreover, in the case of such a narrow laying channel, the soil mechanics and the surface of the ground are only minimally disturbed, so that post-treatment is not necessary. The coordinated operational sequence does not allow the side walls of the laying channel to collapse, so that the soil is also prevented from caving in afterwards.

Therefore, it is respectfully submitted that the recitation of channel width in the claims should be given patentable weight.

Second, the skilled artisan would have understood that both the '997 patent and the '078 patent require relatively wide and deep trenches formed by either a plow 34 ('997 patent) or a digging wheel 15 ('078 patent). For example, the '997 patent buries the cable at a depth of two feet. See the '997 patent at Col. 4, ll. 52-53. Moreover, the skilled artisan would have understood that trenching at this depth requires a cooresponding relatively wide trench. On the other hand, claim 123 recites, *inter alia*, a surface defining a channel having a width of no more than 12 mm, a cable disposed within the channel, the cable including a tube sized to fit within the channel and at least one optical waveguide disposed within the tube. Because the combination of references does not teach each and every feature of claim 123, the Office Action failed to make a *prima facie* case of obviousness. For at least this reason, withdrawal of the sec. 103(a) rejection of claims 123-127, 138, 162, and 163 is warranted and is respectfully requested.

Claims 128 and 130 were rejected under 35 U.S.C. sec. 103(a) applying the '997 and '078 patents in view of U.S. Pat. No. 4,006,315 ('315). For at least the reasons stated above with respect to claim 123, withdrawal of the sec. 103(a) rejection of claims 128 and 130 is warranted and is respectfully requested.

Claim 164 was rejected under 35 U.S.C. sec. 103(a) applying the '997 patent in view of U.S. Pat. No. 4,892,442 ('442). Independent claim 160 was amended to include subject matter indicated allowable by the Examiner. Therefore, withdrawal of the sec. 103(a) rejection of claim 164 is warranted and is respectfully requested.

No other fees are believed due in connection with this Reply. If any fees are due in connection with this Reply, please charge any fees, or credit any overpayment, to Deposit Account Number 19-2167.

Allowance of all pending claims is believed to be warranted and is respectfully requested.

The Examiner is welcomed to telephone the undersigned to discuss the merits of this patent application.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADEIN THE SPECIFICATION:

The paragraph beginning at page 2, line 26 has been amended as follows:

The object of the present invention is to provide a process for introducing an optical cable in which the outlay for the laying operation can be reduced, it also being intended that the outlay for the optical cable system used be coordinated with the laying method. The set object is achieved according to the invention, by a first process of the type explained in the introduction, in that the optical cable used is a microcable or minicable having an external diameter of the tube of 2.0 to 10 mm, preferably 3.5 to 5.5 mm, the tube being homogeneous and pressurized-water-tight, a laying channel with a width of 4.5 to 12 mm, preferably 7 mm, which is adapted to the diameter of the microcable or minicable, being introduced with the laying unit into the solid underlying laying surface, the microcable or minicable [micro[sic]cable] being introduced into the laying channel by means of a feed element and being held at a constant laying depth, the laying channel being filled with filling material using a filling device which is moved along after the insertion of the microcable or minicable.

The paragraph beginning at page 26, line 30 has been amended as follows:

The problem with lifting the minicable or microcable (only the term microcable will be used from now on) is that the cable runs in a laying channel which is covered in a sealed and well-adhering manner with a filling material above the microcable. In this case, use is made of a filling material which has viscous and adhering properties, for example, bitumen. Accordingly, the microcable cannot be drawn out before [not] the filling material is removed. Likewise, further, secondary cutting of the laying

channel is not an option since the filling material would only smear on account of its viscous consistency. The invention solves this problem, then, in that a tension-resistant release element is embedded above the microcable, which release element can be drawn out or pulled out if required and also removes the filling means in this operation. It is advantageous here if, from the outset, the microcable is not wetted with the filling means, so that, as far as possible, there is no adherence between the two. The tension-resistant release element may be designed as a separate element, for example in the form of a line, of a profile body or of a strip. Such release means may consist, for example, of plastic or of metal, for example of steel. However, it is also possible for special release means or plastic materials to be applied around the microcable, for example a plastic film of polyethylene, so that adherence between the microcable and the filling means occurs only negligibly, if at all. Furthermore, it is possible for this purpose that the laying channel be filled above the microcable with a release means which is designed as a filling profile and is pressed into the laying channel, if appropriate with additional sealing with respect to the borders of the laying channel. Once again, a viscous material such as bitumen is particularly suitable for this purpose. Particularly elastic materials, for example rubber or elastic plastics, are suitable for such a filling profile.

The paragraph beginning at page 33, line 16 has been amended as follows:

It is thus expedient to arrange such a detector, as a functional unit for locating cables, in front of a joint-cutting machine, so that any metallic object, for example a cable or supply line, which is located in the ground, is detected in each case. For laying minicables or microcables, detection can take place via the metal tube itself, via a return conductor which is

carried along or else via cable holding-down devices in the laying channel. These cable holding-down devices may also be used, for example, for the power supply and for a protective function for locating the minicable or microcable. It would be possible for holding-down devices to have a fixedly predetermined code or else to be freely programmable. A service vehicle which is used to trace the laid cable is expediently made available for this process. This unit produces the reference for [a] marking points, and stores the route in which the optical cable is laid, so that the route can be transferred onto existing street plans. In this way, both the position and the depth of the laid microcable can be established.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

123. (amended) A fiber optic cable installation structure comprising:

a surface defining a channel having a width of no more than 12 mm;

a cable disposed within the channel, said cable comprising a tube sized to fit within the channel and at least one optical waveguide disposed within said tube; and

a filling material overlying said cable and at least partially filling the channel, said filling material at least partially comprised of material not previously evacuated to form the channel.

124. (amended) The [A] fiber optic cable installation structure according to Claim 123 wherein said cable has a diameter of no more than 10 mm.

125. (amended) The [A] fiber optic cable installation structure according to Claim 123 wherein said surface defines the channel to have a width of no more than 7 mm.

126. (amended) The [A] fiber optic cable installation structure according to Claim 125 wherein said cable has a diameter of no more than 5.5 mm.

127. (amended) The [A] fiber optic cable installation structure according to Claim 123 wherein the surface defines the channel to have a depth of no more than 15 mm.

128. (amended) The [A] fiber optic cable installation structure according to Claim 123 wherein said surface comprises a road

surface.

129. (amended) The [A] fiber optic cable installation structure according to Claim 128 wherein the road surface comprises a base course, a binder course disposed upon said base course and a surface course disposed upon said binder course, and wherein the road surface defines the channel through the surface course and the binder course and at least partially through the base course.

130. (amended) The [A] fiber optic cable installation structure according to Claim 123 wherein said surface comprises a paved surface defining at least one expansion joint which serves as the channel.

131. (amended) The [A] fiber optic cable installation structure according to Claim 123 further comprising a release element disposed within the channel and extending lengthwise along said cable, said filling material also overlying said release element.

132. (amended) The [A] fiber optic cable installation structure according to Claim 131 wherein said release element is formed of a material selected from the group consisting of metal, plastic and foam rubber.

133. (amended) The [A] fiber optic cable installation structure according to Claim 131 wherein said release element is formed of a core surrounded by an elastic coating.

134. (amended) The [A] fiber optic cable installation structure according to Claim 133 wherein the core of said release element is at least as large as said cable.

135. (amended) The [A] fiber optic cable installation structure

according to Claim 123 further comprising an intermediate covering disposed within the channel and overlying said cable, said filling material also overlying said intermediate covering.

136. (amended) The [A] fiber optic cable installation structure according to Claim 135 wherein said intermediate covering comprises at least one insert selected from the group consisting of wires and sensors.

137. (amended) The [A] fiber optic cable installation structure according to Claim 123 wherein said filling material is formed of a material selected from the group consisting of bitumen and a hot melt adhesive.

138. (amended) The [A] fiber optic cable installation structure according to Claim 123 wherein said filling material includes a marker.

139. (amended) The [A] fiber optic cable installation structure according to Claim 138 wherein the marker includes fibers selected from the group consisting of glass fibers and metal fibers.

140. (amended) The fiber optic cable installation structure according to Claim 123 further comprising at least one magnet disposed within the channel, said filling material also overlying said at least one magnet.

141. (amended) The [A] fiber optic cable installation structure according to Claim 123 further comprising a device, disposed within the channel between said cable and said filling material, for holding said cable within the channel.

142. (amended) The [A] fiber optic cable installation structure according to Claim 123 further comprising a foam at least partially surrounding said cable, said filling material also overlying said foam.

143. (amended) The [A] fiber optic cable installation structure according to Claim 123 further comprising a conductive cable disposed within the channel, said filling material also overlying said conductive cable.

144. (amended) A fiber optic cable installation structure comprising:

a surface defining a channel;

a cable disposed within the channel, said cable comprising a tube and at least one optical waveguide disposed within said tube;

a release element disposed within the channel and extending lengthwise along said cable; and

a filling material overlying said cable and said release element and at least partially filling the channel.

145. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said release element is formed of a material selected from the group consisting of metal, plastic and foam rubber.

146. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said release element is formed of a core surrounded by an elastic coating.

147. (amended) The [A] fiber optic cable installation structure according to Claim 146 wherein the core of said release element is at least as large as said cable.

148. (amended) The [A] fiber optic cable installation structure according to Claim 144 further comprising an intermediate covering disposed within the channel between said cable and said release element.

149. (amended) The [A] fiber optic cable installation structure according to Claim 148 wherein said intermediate covering comprises at least one insert selected from the group consisting of wires and sensors.

150. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said surface defines the channel to have a width of no more than 12 mm.

151. (amended) The [A] fiber optic cable installation structure according to Claim 150 wherein said cable has a diameter of no more than 10 mm.

152. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said surface defines the channel to have a width of no more than 7 mm.

153. (amended) The [A] fiber optic cable installation structure according to Claim 152 wherein said cable has a diameter of no more than 5.5 mm.

154. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein the surface defines the channel to have a depth of no more than 15 mm.

155. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said surface comprises a road surface.

156. (amended) The [A] fiber optic cable installation structure according to Claim 155 wherein the road surface comprises a base course, a binder course disposed upon said base course and a surface course disposed upon said binder course, and wherein the road surface defines the channel through the surface course and the binder course and at least partially through the base course.

157. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said surface comprises a paved surface defining at least one expansion joint which serves as the channel.

158. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said filling material is formed of a material selected from the group consisting of bitumen and a hot melt adhesive.

159. (amended) The [A] fiber optic cable installation structure according to Claim 144 wherein said filling material includes a marker.

160. (amended) The [A] fiber optic cable installation structure according to Claim 155 wherein the marker includes fibers selected from the group consisting of glass fibers and metal fibers.

161. (amended) A fiber optic installation comprising:  
an elongate body defining at least one lengthwise extending duct and adapted to be disposed within a channel defined by a surface;  
at least one optical waveguide disposed within a respective duct defined by said elongate body; and

a filling material overlying said elongate body and at least partially filling the channel, wherein said filling material is selected from the group consisting of bitumen and a hot melt adhesive.

162. (amended) The [A] fiber optic installation structure according to Claim 161 wherein said elongate body is sized to fit within a channel having a width of no more than 12 mm.

163. (amended) The [A] fiber optic installation structure according to Claim 161 wherein said elongate body is sized to fit within a channel having a width of no more than 7 mm.

164. (amended) The [A] fiber optic installation structure according to Claim 161 wherein said elongate body comprises a plurality of barbs for engaging walls that define the channel.

165. (amended) The [A] fiber optic installation structure according to Claim 161 wherein said elongate body is sheathed by said filling material.

166. (amended) The [A] fiber optic installation structure according to Claim 161 wherein said elongate body defines a slot opening into the [a] duct.

167. (amended) The [A] fiber optic installation structure according to Claim 166 further comprising a cable inserted into the duct via the slot, said cable comprising a tube and said at least one optical waveguide disposed within said tube.

Please cancel claim 168 without prejudice.